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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/611,817	07/07/2000	Jonathan D. Mohn	AMAT/4666/ETCH/SILICON/JB	6787

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APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/28/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/611,817

Applicant(s)

MOHN ET AL.

Examiner

Michelle Crowell

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-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 21-32 is withdrawn in view of the newly discovered reference(s) to Shan et al. (U.S. 5,891,350). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-4, 9, 10, 12-20, 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 12, and 23 recite the limitation, “substantially tangent”. It is unclear how the sidewall 204c is tangent to both the first and second substantially cylindrical regions 204a, 204b. In order for the sidewall 204c to be tangent to both of the regions, the sidewall 204c must touch the surface of each cylindrical region in a single point. It appears that the sidewall touches the first and second cylindrical regions in several points.

Claims 9, 10, 14, 15, 24 and 25 are indefinite because the phrase “**at least about 30% larger and at least about 20% larger**” is unclear. The term “about” includes a range of either less than or more than. It is unclear how the diameter can be

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both at least and about (see MPEP 2173.05(b) under “about”).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Tepman et al. (U.S. 5,730,801).

The rejection is maintained as stated in paper #7 mailed on October 25, 2002 for reasons of record.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (5,730,801) in view of Benjamin et al. (U.S. 5,820,723).

The rejection is maintained as stated in paper #7 mailed on October 25, 2002 for reasons of record.

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8. Claims 5-15, 19-25, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (5,730,801) in view of Shan et al. (EP 0814495).

Tepman fails to teach one or more chamber liners, a plasma confinement flange, and a barrier flange.

Referring to Figure 1, page 3, lines 24-36, page 4, lines 18-41, page 9, line 17-27, page 10, lines 12-49, Shan teaches shields 10, 12, 13, 40 and 42 (liners) which cover a substantially cylindrical processing region adjacent the substrate support 30 and an exhaust region 54 adjacent the chamber outlet 50. The shields are used to prevent unwanted deposits from accumulating on the chamber components such as walls, substrate support, spacers, throttle valve, and vacuum pump (page 9, lines 17-27, page 10, lines 36-49). The liners include opening 26 for the substrate to enter the chamber and opening 51 for the exhaust gases to exit the chamber. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide both the first and second cylindrical regions of Tepman with liners as taught by Shan. This would prevent unwanted deposits from accumulating on the chamber components such as walls, substrate support, spacers, throttle valve, and vacuum pump.

Furthermore, the annular protrusion 14 of Shan et al. acts as the plasma confinement flange and annular protrusion 16 acts as the barrier flange. The annular protrusions 14, 16 are used to prevent plasma from entering the exhaust port (page 10, lines 46-49). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Tepman with a plasma confinement flange and a barrier flange as taught by Shan. This would prevent plasma from entering the exhaust port.

Regarding Claims 9, 10, 14, 15, 24 and 25, Tepman in view of Shan does not disclose the

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relative diameters for the cylindrical regions (Tepman 14, 36). However, it is obvious from the drawings that the substrate-processing region (14) has a diameter that is at least 30% larger than the diameter of the exhaust region (36) and is at least 20% larger than the substrate support (62). Also, the relative diameters would have been an obvious design choice to one of ordinary skill in the art. Therefore, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 77 (Fed. Cir. 1984), cert. Denied, 469 U.S. 830, 225 USPQ 232 (1984).

9. Claims 16-18, 26-28, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (5,730,801) in view of Shan et al. (EP 0814495) as applied to claims 5-15, 19-25, and 29-32 above, and further in view of Benjamin et al. (U.S. 5,820,723).

Tepman in view of Shan fail to show a flat, inductive coil mounted on a chamber lid.

Referring to Figure 1 and column 6, lines 19-41, Benjamin teaches that it conventional to generate plasma in the processing chamber using an inductive-coupling arrangement, wherein a flat, inductive coil is disposed on the top wall of the chamber. It would have been obvious to one of ordinary skill in the art to provide an inductive-coupling arrangement for the processing region of Tepman because it would have been obvious to substitute one conventional plasma-generating arrangement for another (col. 6, lines 23-26). In such an arrangement, a flat coil would be placed on top of the cover (or lid 28) of Tepman's enclosure and the cover would be made of quartz and flat on top as taught by Benjamin.

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Response to Arguments

10. Applicant's arguments filed January 27, 20003 have been fully considered but they are not persuasive.

Applicant has argued that Tepman fails to show a chamber body having an internal volume defined by a first and second substantially cylindrical regions, and by side walls extending substantially tangent a substrate support disposed in the internal volume within the first substantially cylindrical region, and an exhaust system connected to a chamber outlet disposed in fluid communication with the second substantially cylindrical region.

Tepman shows that a sidewall 20 is substantially tangent between both the processing region 12 (first cylindrical region) and the exhaust region 36 (second cylindrical region).

Tepman further includes a substrate support 63.

11. Applicant's arguments with respect to claims 5-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ravi, Zhao, Schoepp, Okamura, Steger, Masuda, Tomoyasu, and Collins disclose chamber liners. Shan et al. is cited as a US equivalent to EP 0814495.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC

April 21, 2003

Alejandro
Luz L. Alejandro
Primary Examiner
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